Application No. 09/892,469
Date November 25, 2003
Reply to office action of January 15, 2003

Amendments to the Specification

Please replace paragraph [0002] with the following amended paragraphs:

a1

[0002] In Optical Communications, passive components are needed to format the transmitted light signals. An opto-electronic component, such as an optical filter, must achieve a very specific filter shape. The filter shape is defined as the relationship between the reflectivity and the wavelength within the filtered band. Each filter shape may be designed or fabricated for a particular application.

Please replace paragraph [0004] with the following amended paragraphs:

a2

In the past, the GFF was fabricated using a myriad of techniques. The most common techniques being the use of thin film coating, planar waveguides, or the concatenation of many Fiber Bragg Gratings (FBG). The above-mentioned techniques have proved to be insufficient as performance characteristics, such as insertion loss, filter shape accuracy, and temperature stability, were inadequate. A GFF with 5 to 6 dB peak attenuation produced a filter shape with an accuracy no lower than 0.5 dB.

Please replace paragraph [0005] with the following amended paragraphs:

a3

U.S. Patent 5,367,588, granted to Hill et al., discloses a method of fabricating Bragg Gratings using a silica glass phase grating mask. The silica glass phase grating mask is positioned between a laser producing a UV light beam and in close proximity to the optical waveguide. Laser irradiation through the phase grating mask results in an interference pattern which is imprinted (photo-induced) into the core of the optical waveguide. The photo-induced refractive index modulation ~~froms~~ forms a fiber Bragg grating which selectively reflects light of specific wavelengths, depending on the modulation periodicity.

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Please replace paragraph [0016] with the following amended paragraphs:

a4

Figure 1 illustrates the phase mask 10 disposed between a light beam source 20 and an optical waveguide 30. An amplitude mask 40 is placed in front of the phase mask. The phase mask 10 has chirped gratings used for precise photo-imprinting of chirped gratings 60 in the core 50 of the optical waveguide . The chirped gratings 60 may be described as periodic variations in index of refraction with a varying pitch along the length of the grating 60. The amount of light passing through the amplitude mask 40 should correspond to the position along the length of the grating 60 such that the refractive index change required at each point along ~~on~~ the gain flattening filter ~~grating~~ is obtained. The phase mask 10 may be made of flat high-quality fused silica or any solid material transparent to the light used. The amplitude mask is made of a material strong enough to block selectively parts of the light beam without being damaged, such as steel. As well, a UV light beam source 20 is preferred for Bragg grating photo-imprinting purposes. Prior to irradiation, the optical waveguide 30 should be a photosensitive material. For GFF purposes, a photosensitized optical fiber strand is most suitable.

Please replace paragraph [0019] with the following amended paragraphs:

a5

The additional step consists of replacing the amplitude mask by a movable, adjustable slit which is used to limit the laser irradiation to specific portions of filter for various amounts of time~~.~~, ~~The~~ the filter response being monitored in real time and compared to the target response during the process~~,~~. This allows a very fine control of the filter shape. In practice, the final target response is exceeded to allow for the loss in attenuation which occurs upon thermal stabilisation of the final product. One could think of fabricating the whole filter with the movable, adjustable slit but that would be much longer and hence less desirable in terms of efficiency.